DOCUMENT RESUME

ED 275 765 TM 860 683

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TITLE Development of the Turkish Form of the Test Anxiety Inventory.
PUB DATE Apr 86
NOTE 30p.; Paper presented at the Annual Meeting of the American Educational Research Association (67th, San Francisco, CA, April 16-20, 1986).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Academic Achievement; Bilingual Students; *Concurrent Validity; *Construct Validity; Correlation; Factor Analysis; Foreign Countries; Higher Education; Item Analysis; *Personality Measures; Predictive Validity; Secondary Education; *Test Anxiety; *Test Construction; Test Reliability; Test Validity
IDENTIFIERS *Test Anxiety Inventory (Spielberger); *Turkey

ABSTRACT

The Turkish edition of the Test Anxiety Inventory (TAI-T) was accomplished in three stages, each stage constituting an independent study with new samples. In the first study, using bilingual Turkish high school and college students, the transliteral equivalence between the Turkish and English TAI items were achieved. The second study, using a larger sample of monolingual Turkish students, tested the stability, item homogeneity and internal consistency of this form. In the third study, where heterogeneous monolingual Turkish student samples were utilized, the criterion and construct validities of the TAI-T were assessed. Moderate significant correlations between the TAI-T and various personality measures as well as academic achievement were obtained and provided support for the concurrent, predictive and construct validity of the instrument. Factor analysis yielded more than two factors for this form. Data were interpreted to suggest a three factor (worry, emotionality and nervousness) structure for the Turkish TAI. (Author/JAZ)

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DEVELOPMENT OF THE TURKISH FORM OF THE TEST ANXIETY INVENTORY

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A B S T R A C T

DEVELOMENT OF THE TURKISH FORM OF THE TEST ANXIETY INVENTORY

The Turkish edition of the TAI was accomplished in three stages, each stage constituting and independent study with new samples. In the first study, using bilingual Turkish students, the transliteral equivalence between the Turkish and English TAI items were achieved. The second study, using a larger sample of monolingual Turkish students, tested the stability, item homogeneity and internal consistency of this form. In the third study, where heterogeneous monolingual Turkish student samples were utilized, the criterion and contruct validities of the TAI-T were assessed. Moderate significant correlations between the TAI-T and various personality measures as well as academic achievement were obtained and provided support for the concurrent, predictive and construct validity of the instrument. Factor analysis yielded more than two factors for this form. Data were interpreted to suggest a three factor (worry, emotionality and nervousness) structure for the Turkish TAI.

DEVELOPMENT OF THE TURKISH FORM OF THE TEST ANXIETY INVENTORY[x]

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Research for the development of the Turkish TAI (TAI-T) was conducted in three stages, and each stage consisted of an independent study. These studies are on (1) the transliteral equivalence, (2) the reliability, and (3) the validity of the TAI-T. The first two studies were reported and published elsewhere (Öner and Kaymak, 1985, 1986). This presentation is a report on the third study which deals mainly with the construct validity of the instrument. Before reporting it, however, I would like to summarize the first two studies.

The Turkish translation of the TAI was tested on 164 (66 male and 98 female) bilingual high school and university Turkish students from İstanbul. The translation of the test items was accomplished by the author and tested by a graduate assistant and two American bilingual teachers. The backtranslation technique was used by which the translated items were compared with the original. This enabled the author to check errors and inconsistencies in the language, or in the conceptualization of the items. The final Turkish version was achieved after several revisions.

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[x]Paper presented at the International Symposium on Test Anxiety, AERA Annual Meeting, April 16-20, 1986, San Francisco.

Three experimental forms of the TAI developed for experimental purposes, and the original English TAI were used to compare the items psycholinguistically. These four forms were the English TAI (Form A), the translated Turkish TAI (Form B), and two split or mixed language forms, half English and half Turkish (Form C and Form D). In the split language forms ten randomly determined items were in English; the remaining ten items were in Turkish. Those which appeared in English in one form were in Turkish in the other form.

By use of counterbalancing technique controlling the order of language presentation, four groups of bilingual Turkish students were given the four TAI forms randomly. Students were tested twice, once in English and then in Turkish within a two week interval.

Three experimental forms, that is the Turkish and mixed language forms, were compared with the English form of the TAI. All comparisons yielded nonsignificant differences. The mean scores obtained from two language forms were almost identical, indicating that subjects responded similarly to the TAI items in English and in Turkish. The correlations between the Turkish and English TAI scores for various experimental groups were also all above .85. These results were interpreted as supporting evidence for the transliteral equivalence of the two TAI forms.

The second study tested the reliability of the experimental Turkish TAI on a new group of Turkish student sample from the metropolitan İstanbul schools. 1031 (597 male and 434 female) students from three levels of education, junior high (N= 427), senior high (N= 331), and university (N= 273), also covering three SES levels (high, middle, and low) were administered the test. The age of the students ranged between 13 and 22.

To test the stability of the inventory, students were tested twice with five different time intervals, ranging from the same day to three weeks. Results of the test-retest correlations varied between .93 (for one day), .81 (for two weeks), and .72 (for three weeks). These are close to correlations obtained from the two week interval testing with parallel language forms in the transliteral equivalence study. Stability coefficients ranged between .94 and .85 for the Turkish and the English item forms. The above findings are consistent with the English TAI data reported in the test manual (Spielberger, 1980) and elsewhere in the literature.

The internal consistency and homogeneity of the inventory were assessed by Cronbach's alpha and item-remainder correlations. The obtained alpha coefficients are presented in Table 1 in the form of the **TAI-Total**, Worry, and Emotionality[1] scales for each sample group.

Table 1: Alpha Coefficients Obtained from Different Sample Groups for the Total, Worry, and Emotionality TAI-T Scores.

Sample	N	Total	Worry	Emotionality
Grand Total	1031	.87	.74	.79
University	273	.89	.69	.84
Senior High School	331	.87	.76	.79
Junior High School	427	.84	.73	.75

The alpha coefficients for the entire sample TAI-T Total scale was .87, ranging between .82 and .92 for specific school samples. Generally coefficients were higher at the university level than the senior and junior high school levels. For the Worry and Emotionality subscales the total sample coefficients were .74 and .79, respectively. Highest alpha's (around .80) were obtained from the university sample on the Emotionality subscale. The Worry subscale yielded lower values.

In general the high alpha coefficients were interpreted to indicate high homogeneity of the TAI-T Total scale, and Emotionality subscale. The Worry subscale, however, did not prove as highly homogeneous, although it has slightly higher alpha coefficients than other adaptations, such as the Hungarian (.65-.69) or the Italian (.62-.74) forms.

[1]The original English TAI/W and TAI/E dimensions are used in this study until factor analysis of the Turkish TAI is completed.

Data on internal consistency were obtained from the item-remainder correlations as shown in Table 2.

Table 2: The Mean, Median, and Range of Item-Remainder Correlation Coefficients for the TAI-T Total, Worry, and Emotionality Scores of the Turkish University, Senior, and Junior High School Students.

TAI-T	University (N=273)	Senior High School (N=331)	Junior High School (N=427)	Total (N=1031)
Total				
Mean	.53	.50	.45	.49
Median	.53	.51	.46	.50
Range	.32-.69	.36-.65	.24-.58	.35-.62
Worry				
Mean	.44	.52	.48	.50
Median	.43	.53	.47	.49
Range	.36-.66	.37-.66	.38-.54	.37-.59
Emotionality				
Mean	.62	.55	.51	.56
Median	.62	.57	.50	.57
Range	.58-.68	.44-.61	.41-.57	.47-.59

The mean and median correlations were generally above .45 and increased with the age of the sample groups.

The Emotionality subscale item-remainder correlations were higher than the Worry subscale or the Total scale correlations.

Comparing these correlations with those obtained from other adaptations they were found higher than the Hindi (Sharma, et.al., 1983), the Hungarian (Sipos, et.al., 1985), and the Italian (Comunian, 1985) forms, but slightly lower than the original American form.

Together with the alpha coefficients these item-remainders attest to the adequacy of the internal consistency of the experimental TAI-T.

Cross-cultural comparisons of psychometric characteristics of various TAI

adaptations including the Korean, Hindi, Hungarian, German, and Dutch, and the original American TAI showed that the Turkish TAI Total means were quite similar to the American and German means. On the Worry and Emotionality subscales, mean scores were also close to the American values. The alpha coefficients of the Turkish edition were in an intermediate position in this comparison.

Moderately high positive correlations between Worry and Emotionality (.57 to .67) subscales of the TAI-T were obtained as an indication of the discriminant validity of the inventory.

VALIDATION OF THE TURKISH TAI

Some evidence obtained from the reliability data of the second study were indicative of the construct validity of the TAI-T. In this study systematic analyses were conducted on a new sample for construct validation. Correlations of the TAI-T with various measures of personality and academic achievement as well as the factor analysis of the TAI-T were computed.

Method

The subjects consisted of 1551 (844 male and 707 female) high school and college students from İstanbul; age of students ranged between 12 and 22. For ease of data collection the choice of sample was made among schools where student counseling services were available. High, middle, and low socioeconomic level representation was considered in the choice of the schools.

Of the total sample 9.5% constituted the university, 43% the senior high, and 47% the junior high students. The SES representation of the three levels were somewhat similar, but not equal. To be exact, 33.7% constituted the high, 27.5% the middle, and 38.6% the low SES categories. Sex distribution varied in different categories. In the high SES male students comprised 65% of this category, while in the middle SES the reverse was true with the female students constituting 68% of the group.

The instruments used consisted of the Turkish adaptation of the (1) State Trait Anxiety Inventory, (2) Piers Harris Self Concept Scale, or the Way I Feel about Myself (WIFAM), (3) Minnesota Counseling Inventory (MCI), (4) Student Problem Check List, J Form, and the (5) TAI-T.

The first two instruments (STAI and WIFAM) were adapted into Turkish by the author in 1977 and 1985[2], respectively. The latter is in its last stage of development. The shortened Turkish form of MCI was adapted and validated at the School of Education of Bosphorus University by two graduate students (Akdağ, 1979; and Özdemir, 1985) as M.A. thesis projects. Normative data are available on all of these scales.

The Student Problem Check List is similar to the Mooney Problem Check List, developed (Tan, 1952) and published by the Testing Bureau of the Turkish Ministry of National Education. This check list is widely used in the Turkish secondary schools in the guidance counseling offices.

The procedure involved the administration of the TAI-T, STAI, WIFAM, MCI, and Problem Check List to different subsamples in different combinations. The TAI-T was administrated to all subjects. None of the subsample took more than three of the above scales. Test administration was accomplished during guidance hours in schools by a volunteer guidance counselor of the school and an experienced graduate research assistant.

Expectations

The expectations included moderate negative correlations between test anxiety and self evaluation as well as academic achievement, but moderate positive correlations between test anxiety and social, personal adjustment problems. Also the factor structure of the TAI-T was expected to be similar to the original TAI, composed of worry and emotionality factors.

Results

The means and standard deviations for the Turkish form of the TAI obtained from the validity sample (N=1551) are given in Table 3. It is evident from this table that females score consistently higher than males.

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[2]The first two stages of the development of WIFAM were accomplished by Çataklı (1985) under the supervision of this author.

Table 3: Means and Standard Deviations of the Validity Sample of the TAI-T.

TAI-T	University			Senior High			Junior High		
	M	F	Total	M	F	Total	M	F	Total
N	39	100	139	342	314	656	453	279	732
Mean	34.15	42.43	40.11	37.50	41.89	39.60	37.09	41.43	38.74
SD	12.19	12.34	12.81	9.57	10.99	10.50	10.03	11.12	10.66

The magnitude and trend in the means and standard deviations reported here are generally similar to data obtained from the transliteral and reliability studies using bilingual and monolingual Turkish students (Öner and Kaymak, 1985), and consistent with research findings on the other editions of the TAI (Spielberger, 1980, 2; Comunian, 1985; Sipos, et.al., 1985; and Schwarzer, 1984).

Correlations of the TAI-T Scores with Measures of Personality

In order to evaluate the criterion related validity of the Turkish TAI, Pearson Product Moment correlations were computed and reported in table 4.

Table 4: Correlations of the TAI-T Scores with STAI-T A-Trait and Exam A-State Scores.

		TAI-T Total								
		University			Senior High			Junior High		
	Sex	M	F	T	M	F	T	M	F	T
	N	39	100	139	77	37	114	40	22	62
STAI	A-Trait	.54	.51	.56	.39	.49	.48	.44	.70	.56
	Exam A-State	.53	.54	.55	.43	.51	.51	-	-	-

The correlations between the TAI-T Total and the STAI-T A-Trait and Exam A-State scores were moderate positive ($p<.01$). The A-Trait correlations seemed slightly higher for the university students than the high school students, and females in general.

Such moderate positive correlations were also reported by other researchers using various editions of the TAI. These correlations were .45 and .61 for Hindi; .38 and .52 for Dutch; .54 and .49 for Italian; and .54 and .63 for Hungarian males and females, respectively (Sharma, et.al., 1983, 187; van der Ploeg, 1983, 194-195; Comunian, 1985, 219; and Sipos, et.al., 1985, 224).

For construct validity supportive evidence were obtained from correlations between TAI-T Total and various personality measures such as the Piers Harris Self Concept (The Way I Feel About Myself, WIFAM) Scale; the Minnesota Counseling Inventory (MCI), and the Student Problem Check List. Table 5 shows these correlations.

Moderately negative significant ($p<.01$) correlations between TAI-T and Piers Harris Self Concept Scale (WIFAM), a measure of general self perception and subjective self evaluation, indicate test anxious students' tendency to develop inadequate (negative) self concepts.

Correlations of the TAI-T with the Minnesota Counseling Inventory subscales, measuring personality characteristics of high school students, were generally moderately positive and significant ($p<.01$). High scores in the MCI subscales are indicative of poor standing in a particular characteristic measured. Accordingly, these correlations can be interpreted to mean that test anxiety proneness goes with inadequate social/psychological status.

Table 5: Correlations of the TAI-T with the Piers Harris Self Concept Scale (WIFAM), Minnesota Counseling Inventory (MCI), and Student Problem Check List, J Form.

	Senior High			Junior High		
Sex	M	F	T	M	F	T
N	342	314	656	453	279	732
WIFAM	-.43	-.56	-.50	-.44	-.48	-.47
N	120	197	397			
MCI						
Family Relations	.35	.22	.27			
Social Relations	.38	.52	.47			
Emotional Stability	.50	.50	.60			
Conformity	.28	.26	.26			
Reality	.43	.36	.39			
Mood	.51	.53	.63			
Leadership	.34	.51	.46			
N				41	23	
Student Problem Check List						
Health and Pysical Development				-.01	.30[x]	
School Adjustment				-.01	.33[x]	
Home Family				-.19	.25	
Social Relations				-.01	.13	
Boy-Girl Relations				-.03	.24	
Self Centered Concerns				.08	.25	

[x] $p < .10$

Low positive TAI-T correlations with Student Problem Check List items were obtained from a group of junior high school girls. Only one of these correlations (school problems) approached significance ($p < .10$), however, indicating that test anxious girls tend to experience more school problems than the low anxious. Boys' correlations were generally around zero.

Correlations of the TAI-T Scores with Academic Achievement

The obtained correlations between TAI scores and the grade point average (GPA) were obtained only from two groups of high school students, as shown in Table 6.

Low moderate negative correlations were obtained, but only six were statistically significant. They were on the TAI-T Total and TAI-T/W scales, and generally true for boys. None of the girls' nor the emotionality correlations reached significance.

Table 6: Correlations of the TAI-T Scores with Academic Achievement.

		M	F	T
Senior High	N	83	43	126
	TAI-T Total	$-.28^{xxx}$	-.22	$-.23^{xx}$
Junior High	N	84	26	110
	TAI-T Total	$-.30^{x}$	-.25	$-.27^{xx}$
	Worry	$-.43^{x}$	-.25	$-.40^{xxx}$
	Emotionality	-.18	-.21	-.18

$^{x}p<.05$ $^{xx}p<.02$ $^{xxx}p<.01$

The moderate, significant negative correlations between the Worry subscale and GPA, compared to low, nonsignificant Emotionality and GPA correlations, indicate that the Worry subscale has a better potential for predicting school achievement than the Emotionality subscale. Those results are consistent with expectations of Liebert and Morris (1967), and the research findings of Spielberger (1980), Sharma (1983), and van der Ploeg (1983), providing evidence for both predictive and construct validity of the TAI-T/W.

Factor Analysis of the TAI-T

The responses of 1551 university and high school students were also evaluated in separate factor analyses for males and females, and according to education levels, using the SPSS-X principal factors method with varimax rotation and non-orthogonal oblique rotation to explore if the factorial structure of this Turkish edition is similar to the other TAI editions.

Factors obtained and salient factor loadings (.35 and above) for the 20 TAI-T items are reported in Tables 7 through 11 for the total, male, female, university and highschool samples. Both varimax and non-orthogonal obligue rotations resulted in same grouping of variables.

Although three factors seemed to portray the composition of the Turkish TAI, (as three factors were obtained in three of the five samples) the analysis also yielded two factors from the university and four factors from the male samples.

The worry factor was clearly identified in all five sample groups, as a second factor with the oblique method, and first factor with the varimax method, for male and female samples. Items comprising this factor were exactly the same eight worry items of the Erglish TAI. The other two factors, commonly identified in most of the sample groups were emotionality (5 to 7 items), and nervousness or nervous tension (5 to 6 items). Half of the original emotionality items appeared in one factor, called emotionality in this study, the other half in the nervousness factor. A fourth factor that was obtained from the male sample consisted of two items only and could not be labeled by this researcher. With the oblique method emotionality was the first factor for the total, university and highschool samples while nervousness proved to be the first factor for the male and female samples.

Using the non-orthogonal rotations moderate correlation were obtained between worry-emotionality and worry-nervousness. They were -.47, 40 and .63 for worry-emotionality; and -.41, .37 and .44 for worry-nervousness factors. Nervousness and emotionality also corelated moderately with r's ranging between -.47 and .41.

Table 7(a): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for the Total Sample (N=1520).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III
1		2.47	.83	.32		
2	W	1.85	.87		.69	
3	W	1.65	.83		.39	
4	W	1.55	.87		.70	
5	W	2.14	.93		.47	
6	E	1.90	.86			-.57
7	E	1.95	.96			-.77
8	W	1.92	.95		.64	
9	E	1.70	.88			-.67
10		1.42	.77			-.73
11	E	2.26	1.00	.52		
12	W	1.45	.76		.45	
13	E	2.04	.88			-.49
14	E	1.92	.94	.42		
15		2.60	1.27	.55		
16	E	2.19	.96	.61		
17	W	1.99	.97		.56	
18	E	2.35	1.03	.68		
19		2.05	.97	.64		
20	W				.40	
Eigenvalues				6.89	1.26	1.02
Unrotated variance				34.5%	6.3%	5.1%

[x] oblique rotation

Table 7(b): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for the Total Sample (N=1520).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III
1		2.47	.83	.39		
2	W	1.85	.87			.16
3	W	1.65	.83			.46
4	W	1.55	.87			.65
5	W	2.14	.93			.47
6	E	1.90	.86		.59	
7	E	1.95	.96		.73	
8	W	1.92	.95			.65
9	E	1.70	.88		.67	
10		1.42	.77		.68	
11	E	2.26	1.00	.54		
12	W	1.45	.76			.49
13	E	2.04	.88		.54	
14	E	1.92	.94	.51		
15		2.60	1.27	.54		
16	E	2.19	.96	.64		
17	W	1.99	.97			.58
18	E	2.35	1.03	.66		
19		2.05	.97	.61		
20	W					.47
Eigenvalues				6.89	1.26	1.02
Unrotated variance				34.5%	6.3%	5.1%

[x] varimax rotation

Table 8(a): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for males (N=835).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III	Factor IV
1		2.33	.84		.41		
2	W	1.83	.85		.71		
3	W	1.56	.79		.47		
4	W	1.55	.87			-.56	
5	W	2.05	.93		.65		
6	E	1.79	.83	.47			
7	E	1.77	.92	.75			
8	W	1.87	.95		.65		
9	E	1.59	.82	.74			
10		1.29	.65	.64			
11	E	2.12	.98				-.35
12	W	1.39	.73		.33		
13	E	1.94	.84	.39			
14	E	1.72	.86				-.45
15		2.51	1.26		.53		
16	E	2.02	.91				-.68
17	W	1.94	.95				-.55
18	E	2.18	1.02				-.79
19		1.89	.93				-.65
20	W	1.80	.87		.45		
Eigenvalues				6.31	1.22	1.06	1.02
Unrotated variance				31.6%	6.1%	5.3%	5.1%

[x] oblique rotation

Table 8(b): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for males (N=835).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III	Factor IV
1		2.33	.84	.45			
2	W	1.83	.85	.66			
3	W	1.56	.79	.51			
4	W	1.55	.87				.56
5	W	2.05	.93	.61			
6	E	1.79	.83			.53	
7	E	1.77	.92			.72	
8	W	1.87	.95	.65			
9	E	1.59	.82			.73	
10		1.29	.65			.59	
11	E	2.12	.98			.42	
12	W	1.39	.73	.39			
13	E	1.94	.84			.47	
14	E	1.72	.86				-.52
15		2.51	1.26		.51		
16	E	2.02	.91		.67		
17	W	1.94	.95		.56		
18	E	2.18	1.02		.72		
19		1.89	.93		.61		
20	W	1.80	.87	.51			
Eigenvalues				6.31	1.22	1.06	1.02
Unrotated variance				31.6%	6.1%	5.3%	5.1%

[x] varimax rotation

Table 9(a): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for females (N=690).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III
1		2.65	.80	.39		
2	W	1.88	.89		.69	
3	W	1.76	.86		.43	
4	W	1.55	.86		.66	
5	W	2.24	.93		.51	
6	E	2.04	.88	.62		
7	E	2.16	.97	.73		
8	W	1.95	.96		.69	
9	E	1.84	.92	.58		
10		1.58	.86	.77		
11	E	2.43	1.01			.57
12	W	1.52	.78		.53	
13	E	2.15	.91	.60		
14	E	2.14	.98			.36
15		2.70	1.27			.53
16	E	2.39	.97			.60
17	W	2.06	.99		.60	
18	E	2.55	1.00			.55
19		2.21	1.00			.67
20	W	2.05	.99		.53	
Eigenvalues				7.11	1.31	1.09
Unrotated variance				35.6%	6.6%	5.5%

[x] oblique rotation

Table 9(b): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for females (N=690).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III
1		2.65	.80		.43	
2	W	1.88	.89	.65		
3	W	1.76	.86	.48		
4	W	1.55	.86	.62		
5	W	2.24	.93	.50		
6	E	2.04	.88		.63	
7	E	2.16	.97		.71	
8	W	1.95	.96	.68		
9	E	1.84	.92		.60	
10		1.58	.86		.71	
11	E	2.43	1.01			.58
12	W	1.52	.78	.56		
13	E	2.15	.91		.62	
14	E	2.14	.98			.47
15		2.70	1.27			.55
16	E	2.39	.97			.65
17	W	2.06	.99	.60		
18	E	2.55	1.00			.58
19		2.21	1.00			.66
20	W	2.05	.99	.56		
Eigenvalue				7.11	1.31	1.09
Rotated variance				35.6%	6.6%	5.5%

[x] varimax rotation

Table 10(a): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for university students (N=148).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II
1		2.68	.85	.80	
2	W	1.86	.87		.64
3	W	1.71	.83		.44
4	W	1.62	.88		.83
5	W	2.08	.83	.45	
6	E	2.13	.89	.57	
7	E	2.30	.97	.60	
8	W	1.86	.85		.74
9	E	1.86	.95	.56	
10		1.65	.89	.62	
11	E	2.37	.92	.85	
12	W	1.43	.71		.56
13	E	2.21	.92	.80	
14	E	1.99	.94	.68	
15		2.68	1.26	.66	
16	E	2.11	.98	.68	
17	W	1.84	.88		.83
18	E	2.01	.85	.64	
19		1.96	.97	.61	
20	W	1.74	.90	.57	
Eigenvalue				9.62	1.18
Unrotated variance				48.1%	5.9%

[x] oblique rotation

Table 10(b): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for university students (N=148).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II
1		2.68	.85	.73	
2	W	1.86	.87		.65
3	W	1.71	.83		.54
4	W	1.62	.88		.76
5	W	2.08	.83	.46	
6	E	2.13	.89	.60	
7	E	2.30	.97	.62	
8	W	1.86	.85		.74
9	E	1.86	.95	.60	
10		1.65	.89	.57	
11	E	2.37	.92	.73	
12	W	1.43	.71		.56
13	E	2.21	.92	.75	
14	E	1.99	.94	.69	
15		2.68	1.26	.63	
16	E	2.11	.98	.68	
17	W	1.84	.88		.83
18	E	2.01	.85	.55	
19		1.96	.97	.56	
20	W	1.74	.90	.59	
Eigenvalue				9.62	1.18
Unrotated variance				48.1%	5.9%

[x]varimax rotation

Table 11(a): Means, Standard Deviations, and Factor Loadings[X] for the 20 TAI-T Items for high school students (N=1375).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III
1		2.44	.83	.38		
2	W	1.85	.87		.70	
3	W	1.64	.83		.38	
4	W	1.54	.86		.69	
5	W	2.14	.94		.50	
6	E	1.88	.86			-.52
7	E	1.91	.96			-.74
8	W	1.92	.96		.63	
9	E	1.68	.87			-.68
10		1.40	.75			-.76
11	E	2.25	1.02	.55		
12	W	1.46	.76		.45	
13	E	2.02	.87			-.45
14	E	1.91	.94	.40		
15		2.59	1.27	.65		
16	E	2.20	.96	.57		
17	W	2.01	.98		.53	
18	E	2.38	1.04	.61		
19		2.04	.97	.61		
20	W	1.93	.94		.41	
Eigenvalue				6.63	1.28	1.01
Unrotated variance				33.2%	6.4%	5.0%

[X] oblique rotation

Table 11(b): Means, Standard Deviations, and Factor Loadings[x] for the 20 TAI-T Items for high school students (N=1375).

Item	Subscale	Item Mean	Item SD	Factor I	Factor II	Factor III
1		2.44	.83	.43		
2	W	1.85	.87		.67	
3	W	1.64	.83		.45	
4	W	1.54	.86		.63	
5	W	2.14	.94		.50	
6	E	1.88	.86			.55
7	E	1.91	.96			.70
8	W	1.92	.96		.64	
9	E	1.68	.87			.67
10		1.40	.75			.71
11	E	2.25	1.02	.56		
12	W	1.46	.76		.48	
13	E	2.02	.87			.51
14	E	1.91	.94	.49		
15		2.59	1.27	.60		
16	E	2.20	.96	.61		
17	W	2.01	.98		.55	
18	E	2.38	1.04	.61		
19		2.04	.97	.60		
20	W	1.93	.94		.48	
Eigenvalue				6.63	1.28	1.01
Unrotated variance				33.2%	6.4%	5.0%

[x]varimax rotation

These findings are interpreted to indicate that the Turkish TAI is generally a three factor phenomenon rather than two factor as demonstrated in the original English form, the Dutch and Egyptian editions. However, test anxiety may possibly be composed of more than two factors has also been suggested by the factor analysis of the Korean edition of the TAI (Schwarzer, 1984) and other anxiety researchers such as Sarason (1984) and Stephan et.al (1983) as cited in Schwarzer (1984). Our data provide support for these claims.

ACKNOWLEDGEMENTS

Three people at Bosphorus University have helped in the preparation of this paper. Deniz Albayrak Kaymak (M.A.), research assistant, assisted in the data collection and data preparation for computer analysis. Yılmaz Esmer (Ph.D.), Associate Professor of Sociology, did the programming for the data analysis using SPSS-X; and Meltem Özturan, Instructor, ran the analysis in the computer. I am grateful to them all.

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13. Sınavlar sırasında kendimi çok gergin hissederim.
    During tests I feel very tense. (No. 11)

14. Önemli bir sınav sırasında paniğe kapılırım.
    I feel very panicky when I take an important test. (No.15)

15. Sınavların beni bu kadar rahatsız etmemesini isterdim.
    I wish examinations did not bother me so much. (No. 12)

16. Önemli bir sınava girmeden önce çok endişelenirim (kurarım).
    I worry a great deal before taking an important examination. (No. 16)

17. Sınavlar sırasında, başarısız olmanın sonuçlarını düşünmekten kendimi alamam.
    During tests I find myself thinking about the consequences of failing. (No. 17)

18. Önemli sınavlarda kalbimin çok hızlı attığını hissederim.
    I feel my heart beating very fast during important tests. (No.18)

19. Sınav sona erdikten sonra endişelenmemeye (kurmamaya) çalışırım, fakat yapamam.
    After an exam is over I try to stop worrying about it, but I just can't. (No.19)

20. Sınavlar sırasında öylesine sinirli olurum ki aslında bildiğim şeyleri bile unuturum.
    During examinations I get so nervous that I forget facts I really know. (No. 20)

TEST ANXIETY INVENTORY

TURKISH AND ENGLISH TEST ITEMS

1. Sınav sırasında kendimi güvenli ve rahat hissederim.
   I feel confident and relaxed while taking tests. (original item no.1)

2. O dersten alacağım notu düşünmek, sınav sırasındaki başarımı olumsuz yönde etkiler.
   Thinking about my grade in a course interferes with my work on tests.(No.3)

3. Önemli sınavlarda donup kalırım.
   I freeze up on important exams. (No.4)

4. Sınavlar sırasında, birgün okulu bitirip bitiremeyeceğimi düşünmekten kendimi alamam.
   During exams I find myself thinking about whether I'll ever get through school. (No.5)

5. Bir sınav sırasında, ne kadar çok uğraşırsam kafam o kadar çok karışır.
   The harder I work at taking a test, the more confused I get. (No.6)

6. Sınavlarda kendimi huzursuz ve rahatsız hissederim.
   While taking examinations I have an uneasy, upset feeling. (No.2)

7. Önemli bir sınav sırasında kendimi çok sinirli hissederim.
   I feel very jittery when taking an important test. (No.8)

8. Başarısız olma düşünceleri, dikkatimi sınav üzerinde toplamama engel olur.
   Thoughts of doing poorly interfere with my concentration on tests. (No.7)

9. Bir sınava çok iyi hazırlandığım zamanlar bile kendimi oldukça sinirli hissederim.
   Even when I'm well prepared for a test, I feel very nervous about it. (No.9)

10. Önemli sınavlarda sinirlerim öylesine gerilir ki midem bulanır.
    During important tests I am so tense that my stomach gets upset. (No. 13)

11. Bir sınav kağıdını geri almadan hemen önce çok huzursuz olurum.
    I start feeling very uneasy just before getting a test paper back. (No.10)

12. Önemli sınavlarda kendimi adeta yenilgiye iterim.
    I seem to defeat myself while working on important tests. (No. 14)